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The Northern Swift Fox in South Dakota

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ABSTRACT

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Investigation by Fish and Wildlife Service research biologist, Conrad Hillman and Department of Game, Fish and Parks have resulted in a five-month preliminary study of the swift fox in Shannon County, South Dakota.

Thirteen fox were captured, marked measured and released. Future plans will include an ecological study of the swift fox, introductions on private land for prairie dog control and a captive breeding program.

Introduction

A Study to determine the taxonomic status, home range, distribution, life history and habitat requirements of the Swift Fox (Vulpes velox spp.) was initiated by the Fish and Wildlife Service with the assistance of South Dakota Department of Game, Fish and Parks. The study was begun in April and was discontinued in September 1977 due to lack of funds. Special thanks go to Conrad Hillman, research biologist for the Fish and Wildlife Service, who gathered most of this data and who most generously provided that data for this report.

Historically there has been documentation of swift fox in South Dakota. It is not known if these populations represent the northern or southern supspecies, hebes or velox respectively.

Records of the Hudson Bay Fur Company show that 10,427 were taken on the upper Missouri and 187 from the Sioux area from 1835 to 1838 (Jour. Mam., 1969 Vol. 50 No. 4). The Lewis and Clark expedition recorded them roughly in the same area in 1819 (James, 1819). The swift fox is about the size of a domestic house cat (Felis domestica). Their basic coloration is rufus sides, brownish grey dorsally, a white belly and throat patch and a black-tipped tail and muzzel.

As the great plains became settled, swift fox populations correspondently decreased and by 1900 the species was rarely seen. It wasn't until the 1960's that scattered reports of swift fox sightings started to come in.

Currently there are now small populations reestablishing themselves in Western South Dakota where none were seen three or four years ago.

Description of Study Area

The study area is located in Shannon County, which in turn is located in the southwest corner of the State and is bordered by Fall River, Custer, Pennington,

Washabaugh and Bennett Counties and by the State of Nebraska (Figure 1). Shannon County is typlified by irregular topographic features such as xeric badlands, deciduous riparian and upland grasslands pastures. The data was collected in habitat examplified by short to mid-grass pastures in rolling hills bordered by the White River.

The study was centered around four or possibly five individual family den sites which were each located within 1.6 kilometers of the river and within 0.80 kilometers or less of a prairie dog (Cynomys ludovicianus) town. Several dens were less than 1/2 kilometer to houses and roads. Most dens were located on hillsides or small plateaus away from flood plains.

Materials and Methods

Dens were found mostly at night by driving around in the pastures and spotlighting. When a fox was seen, it would be kept in sight until it went into a den. Adult fox were sometimes observed bringing food to their young in this manner. Young fox could be observed playing around the burrow entrances of the den and could be approached at distances up to 30 meters before disappearing into their burrows.

Verification of denning activity was done during daylight hours by observations of food remains, fresh tracks and scats or fresh digging sign at the den entrance. Scats and food scraps were removed from each active den site on a weekly basis for later analysis. Identifiable food remains included prairie dogs, ground roosting passerine birds, insects, small rodents and an occasional rabbit. Dimensions of 58 burrow entrances averaged 190 mm wide by 216 mm high. No measurements were taken of length, depth or number of rooms within the dens.

Natal dens, or those dens occupied during the first two months, were dug by the foxes over a period of years or were enlarged badger (Taxidea taxus) or prairie dog holes and had an average of 5.8 entrances per den site. Secondary dens

LOCATION MAP

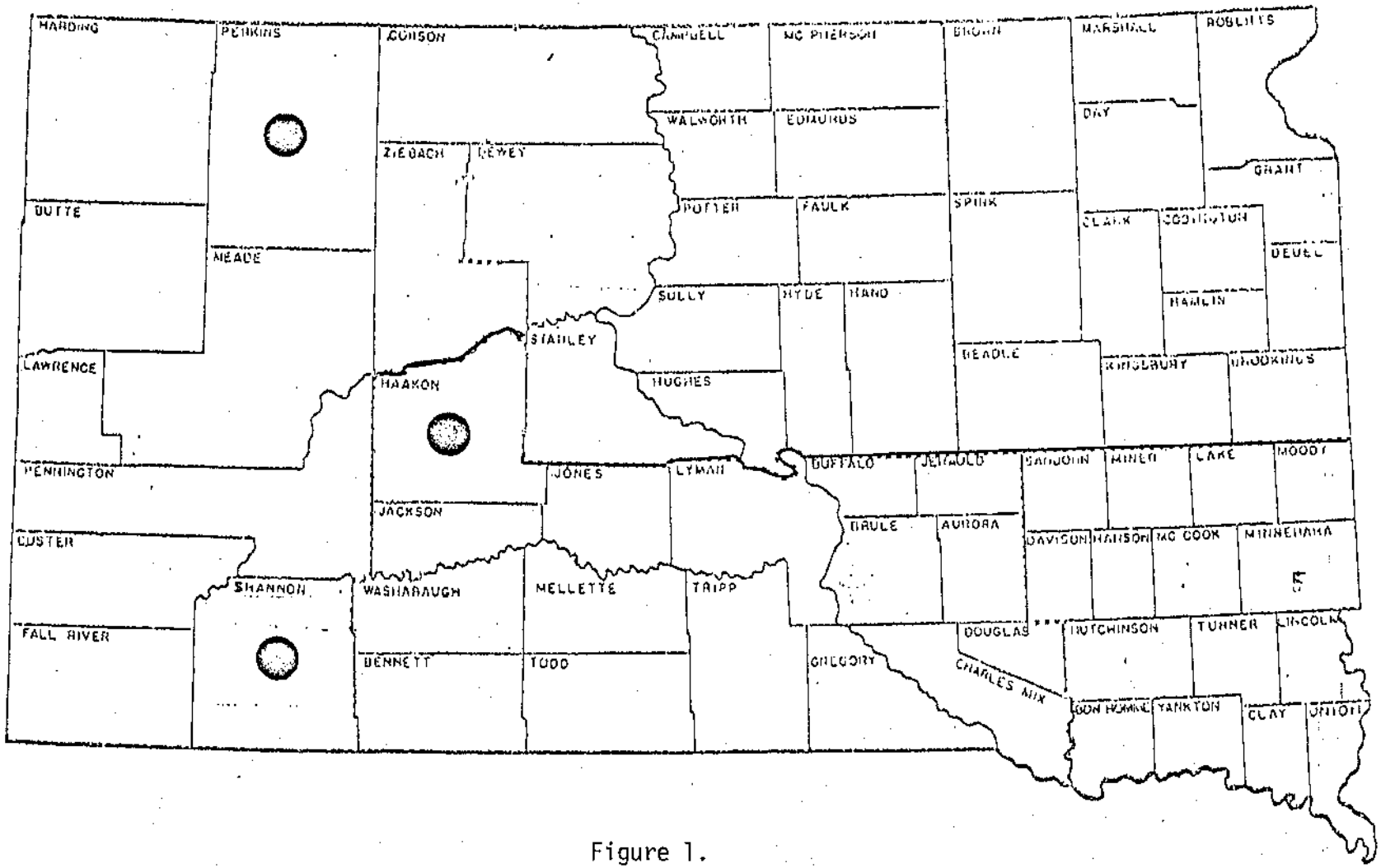

Figure 1.

Counties with verified swift fox populations.

averaged 2.7 entrances per den site and appear to be used as escape cover while hunting, as an escape from a buildup of ecto-parasite populations or as temporary housing for the pups when they became too large to all use the same den system. Adult fox were occasionally observed using abandoned badger or prairie dog burrows as escape cover during daylight hours. Normally the adult fox are primarily nocturnal in habits with the young being more diurnal in that they can be seen most mornings, afternoons and evenings loafing or playing around the den site complex. As the season progresses, the young become less active diurnally.

The home range of a family group of swift fox appeared to be 1.6 to 1.2 Km^2 in size. Family groups utilized an average of 20 burrow entrances per home range.

Fox were live-trapped once a week for a five-month period using National traps measuring approximately 27 x 30 x 89 cm. Traps were set at den entrances known to be inhabited by fox and baited with freshly killed prairie dogs or when available, road-killed passerine birds. Thirteen fox were trapped in this manner. All fox caught but two were sexed, aged, weighed using a 22 Kg Ohaus scale, measured, marked with a #4 metal ear tag, tatooed using a portable Dermo-marker in the opposite ear with a number or symbol, treated for ecto-parasites and released at the same site complex. One fox escaped while being taken from the trap and one young female that had been shot in the right leg was taken to Rapid City to have the leg amputated. This fox is still in captivity and will probably be used in later experiments.

Results

The average time for handling and processing each fox was 25 minutes. Adults seemed to struggle more than the pups when being taken from the trap and held for processing. Both pups and adults remained relatively calm, however, when grasped by the dorsal surface of their neck. When released, adults would usually

run approximately 90 meters, stop and look back for 15 seconds or so before proceeding. All pups but one were released at the burrow entrance and immediately went into the den; one pup was released a few meters from the burrow entrance and did not enter the burrow but ran off somewhat like the adults.

Animals associated with swift fox dens or occupy the same habitat type are badgers, coyotes (Canis latrans), domestic dogs (Canis familiaris spp.), rattlesnakes (Crotalus spp.), burrowing owl (Speotyto cunicularia) and various species of insects. Natural predators of swift fox probably are coyotes, dogs, golden eagle (Aquila chrysaetos) great-horned owls (Bubo virginianus) and man.

Not much is known of swift fox biology. It is reported that swift fox pair for life (Kilgore, 1969). Gestation period is unknown, but is thought to be around 50 days. Litter size ranges from four to six, but is probably variable. Family groups remained together through August with young dispersing sometime around the first of September. Two months prior to dispersal, the pups were noted occupying secondary dens. Both parents appeared to continue to bring food to the pups during this time. The following measurements are averages taken from animals captured during the course of this study. Weight: an adult male, 2.27 Kg; an adult female, 1.81 Kg; a three to five-month-old pup 1.52 Kg. Standard Measurements: Tail: adult male 295 mm; adult female 279 mm; pup 235 mm. Hind foot: adult male 127 mm; adult femals 121 mm; pup 113 mm. Ear at notch: adult male 58 mm; adult female 57 mm; pup 53 mm. (Measurements of total length were not felt to be accurate enough to include here.)

Ecto-parasites were noted in abundance while handling the foxes for processing. Especially abundant were fleas (Pulicidae) and ticks (Acarina).

Mortality and longevity rates are unknown.

The average daily food intake based on observations of the captive fox is 200 gms. Food intake for wild populations is unknown, but is assumed to be close to 200 gms (Kilgore, 1969).

It was noticed that there is a pelage coloration difference between the adult fox and the pups. The red pelage seems to fade out in the adults and the gray turns a little darker or brownish. This coloration change was particularly noted in the captive fox.

Future plans will be directed toward an ecological study of the swift fox. A request for funding will be made to the State Legislature this year to initiate a program studying among other things the potential of using swift fox as a natural control over prairie dogs. Protection will be given the swift fox by including it on the state list of endangered species in the threatened category. A breeding program using captive fox will provide most of the animals used in the prairie dog control program with occasional supplements from the wild population.

At this time I would like to ask for cooperation of the state and federal trappers in helping us to make this program a success. Our state trappers especially can do a lot of good in getting the word out to the general public.

Any swift fox caught in a trap set for another species should be released. If it is too badly damaged to be released or if it's dead, we would like to have the animal to either repair it or if that's not possible, we need the whole carcass for study purposes. We need to get some good PR out on these animals. The public should know that all predators are not bad or harmful to man's economical existance. The swift fox particularly is too small to prey upon domestic livestock. An occasional chicken is about all it's capable of handling at best. The good they'll do by the consumption of prairie dogs, small rodents

and grasshoppers should more than offset any minor problems they might cause. Because of the trusting nature of the swift fox, they are extremely vulnerable to any type of predator control or hunting. They are usually the first to come to a bait station and are very easy to trap. It will take the cooperation of us all if the swift fox is to once again be established on it's remaining former range.

References

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